

No. 21752
No. 21752A

IN THE
United States Court of Appeals
for the Ninth Circuit

SUPER MOLD CORPORATION,
Appellant,
vs.

CLAPP'S EQUIPMENT DIVISION, INC.,
Appellee.

CLAPP'S EQUIPMENT DIVISION, INC.,
Appellant,
vs.

SUPER MOLD CORPORATION,
Appellee.

PLAINTIFF-APPELLANT'S OPENING BRIEF

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PLAINTIFF-APPELLANT'S OPENING BRIEF

This is an appeal by plaintiff from a Summary Judgment and Decree granted by the United States District Court for the Central District of California upon motion of the defendant holding all claims of United States Letter Patent No. 3,162,898 to be invalid and void. Defendant-appellee has filed an ap-

peal alleging the District Court erred in concluding that the case was not an exceptional case within the meaning of 35 U.S.C. 285 justifying the award of reasonable attorneys' fees to defendant.

JURISDICTIONAL STATEMENT

Jurisdiction to review the judgment and decree of the District Court is conferred by 28 U.S.C. 1291. The judgment is a final judgment within the provisions of Rules 54(b) F.R.C.P. and the Rules of this Court. There is no dispute as to the jurisdiction of the subject matter or of the parties.

STATEMENT OF THE CASE

A. History Of The Controversy

Plaintiff-appellant filed its Complaint July 7, 1965 alleging infringement of U. S. Patent No. 3,162,898 directed to tire retreading apparatus. Defendant-appellee Clapp's Equipment Division, Inc. filed an Answer and Counterclaim August 16, 1965. Plaintiff-appellant filed its Reply to the Counterclaim September 1, 1965.

On April 19, 1966 defendant filed a Motion For Separate Trial Under Rule 42(b) F.R.C.P. on the issue of whether or not the invention of the patent in suit is invalid under 35 U.S.C. 102 (b) because placed in public use or on sale in this country more than one year prior to the date of application for the patent. Plaintiff consented to Defendant's Motion for Separate Trial and on April 20, 1966 the District Court ordered a separate trial.

Rather than proceeding with a separate trial, on October 3, 1966, defendant filed a Motion For Summary Judgment. This motion sought a summary judgment that the patent in suit be held invalid under 35 U.S.C. 102(b) because the invention described and claimed in said patent was allegedly in public use and on sale in this country more than one year before the application for said patent was filed. The Motion For Summary Judgment also urged the award of attorneys' fees under 35 U.S.C. 285. Plaintiff filed appropriate papers opposing the Motion For Summary Judgment and the District Court conducted a hearing on the Motion For Summary Judgment December 12, 1966.

On January 10, 1967, the District Court filed Findings of Fact, Conclusions of Law and a Summary Judgment holding all claims of Patent No. 3,162,898 in suit to be invalid and void because the invention had been on sale more than one year prior to the patent filing date, dismissing plaintiff-appellant's Complaint, but holding that the award of reasonable attorney's fees to defendant would not be justified. Plaintiff filed its Notice of Appeal to this Court February 6, 1967 and defendant filed its Notice of Appeal February 7, 1967.

On July 3, 1967, the District Court filed an ORDER CORRECTING AND AMENDING JUDGMENT ON CLAIM FOR PATENT INFRINGEMENT NUNC PRO TUNC, such order specifically reciting that there was no just reason for delay in the entry of the Final Judgment and that the original Judgment

dismissing plaintiff's Complaint constitute a Final Judgment as to the claim of patent infringement.

B. Background Of The Invention

It is absolutely essential to a complete understanding of the issues in this case that this Court be apprised of the background of the invention. In considering such background, this Court should keep in mind that the patent in suit was filed October 29, 1959. Hence, the critical date under 35 U.S.C. 102(b) was October 29, 1958.

In early 1958 the tire retreading industry faced a problem of crooked treads on casings of lighter construction. This problem affected the tire retreading molds sold by Trutred Tire Molds, Inc., as well as the molds made by competitors of Trutred. (Fike Depo. 17). Trutred was purchased by plaintiff in 1960. The crooked tread problem was compounded by the variety of tire tread designs, the different ply thicknesses, carcass strength and other miscellaneous factors (Fike Depo. 13). Sears, Roebuck & Co., a Trutred customer, was using approximately 250 tire molds and requested Louis T. Fike, the inventor of the patent in suit and General Manager and Vice President of Trutred, to attempt to solve this industry-wide problem (Record 263). Sears had previously in February 1958 requested the defendant in this action to solve such problem (Record 169), but so far as the record is concerned, defendant was unable to provide a satisfactory solution.

Upon being apprised of the problem, the inventor Fike conceived a so-called "Bead or Tread Aligner"

(sometimes referred to as "Centering Rings") which he believed could be added as an accessory to the existing tire retreading molds and function so as to eliminate the problem of crooked tire treads. Upon informing Sears of his proposed solution, Sears requested Fike to design two prototype Bead Aligners and install them on two tire molds owned by Sears (Record 263). These two prototypes were completed and operated at the Sears Retreading Plant in Los Angeles, California in April and May of 1958 (Record 271). Although such prototypes were not commercially usable devices, the preliminary testing thereof indicated to Fike that the broad inventive principles were probably correct and in June 1958 he informed Sears of this fact.

Sears then stated it would order from Trutred approximately 248 Bead Aligners, one for each existing tire mold (Record 206). Note that this order was "on approval" — Answer to Interrogatory 1. (i) (Record 117).

C. The Necessity Of The Experimental Program

At this point in time the inventor Fike believed his inventive concept was sound even though the two prototypes were not commercially useable because of frequent breakdowns (Record 274). In this regard, it should be noted that if a Bead Aligner breaks down, the tire retreading mold to which it is attached must be taken out of service pending repair of the Bead Aligner. Thus, an important capital investment is tied up by the malfunction of but one of its parts (Fike Depo. 29).

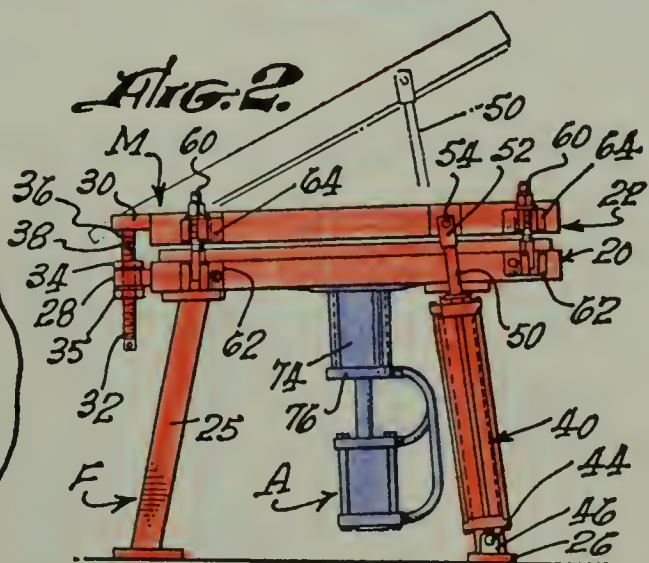
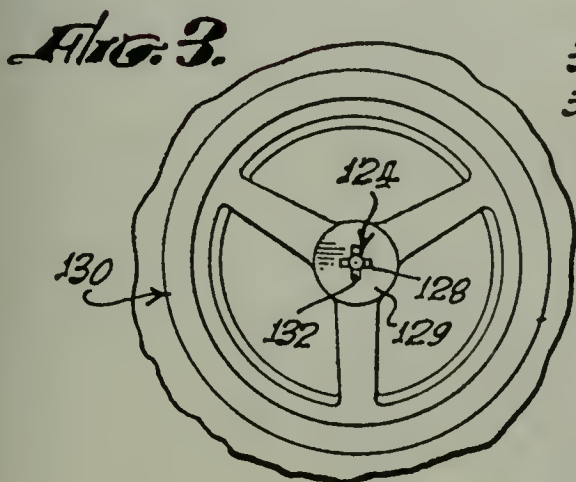
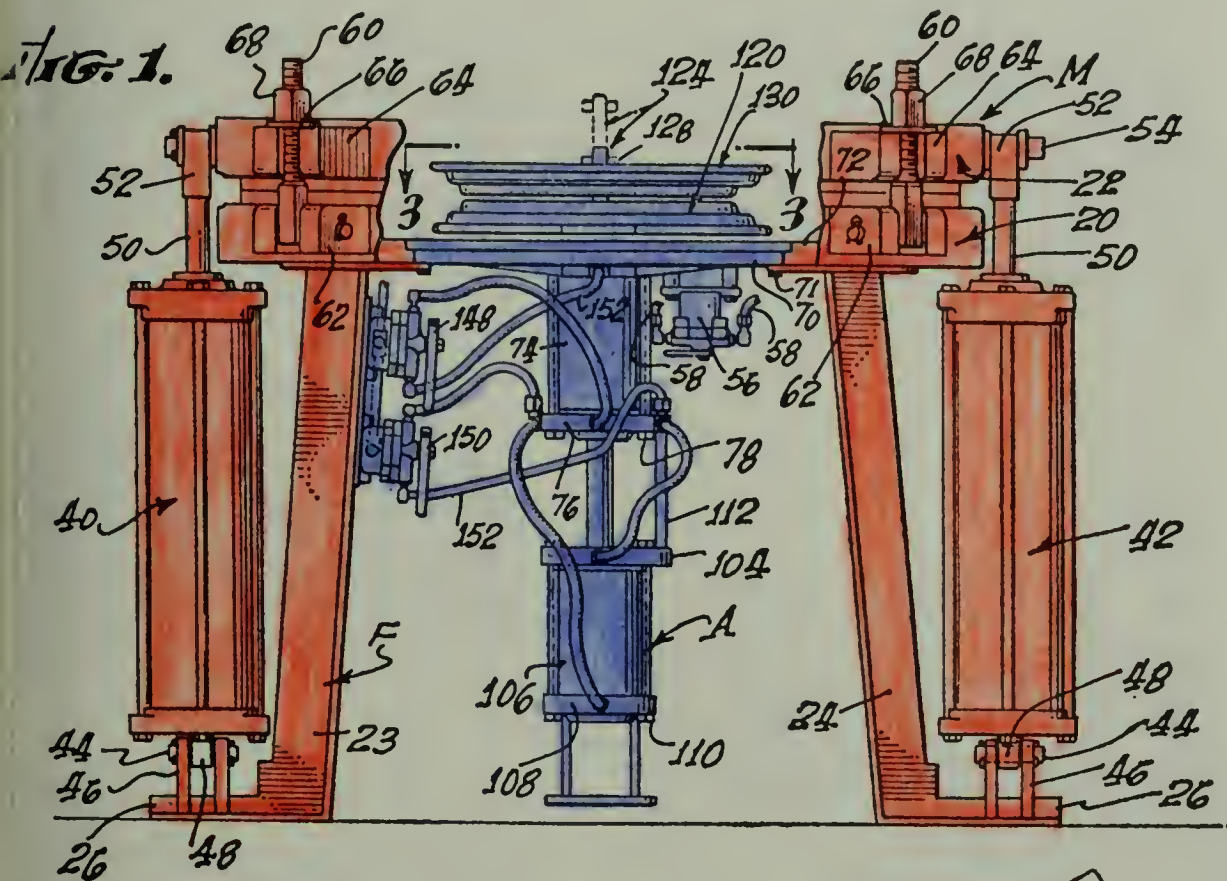
Under these circumstances, Fike realized it would be necessary to conduct further development and testing before his Bead Aligner could become a commercially useable product, and further that if he had attempted to complete such research and development program using only the original one or two prototypes, it would literally have taken years to complete such program (Record Page 271). This was true because of the aforementioned fact that the tire retreading molds were used with tires of varying tread designs, ply thickness and carcass strength (Fike Depo. 12), as well as by different types of personnel (Record 274). Additionally, The Fike Bead Aligner had to be fitted not only to the Trutred tire mold but also to competitors' tire molds being operated by Sears (Record 213). Moreover, since Trutred was a small company the expenditures necessary for a vigorous experimental program would be too heavy (Fike Depo. 15). Trutred was not in the tire retreading business and did not have facilities for full scale testing of the Bead Aligners (Record 271).

Under these circumstances, to expedite such experimental program, Fike on August 5, 1958 formally acknowledged the Sears' order for approximately 248 Bead Aligners, such Bead Aligners to be installed upon existing Sears' tire retreading molds (Record 271) and Finding of Fact 5, (Record 326).

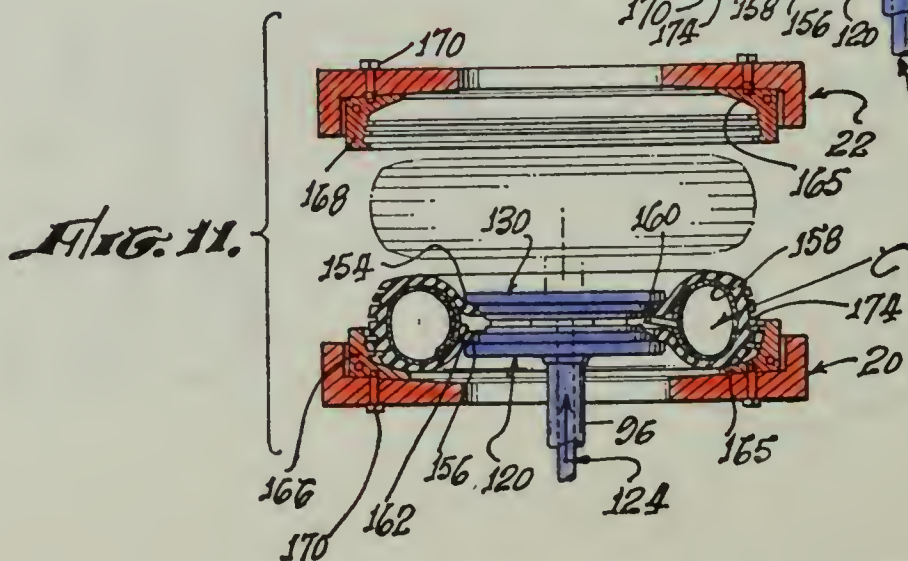
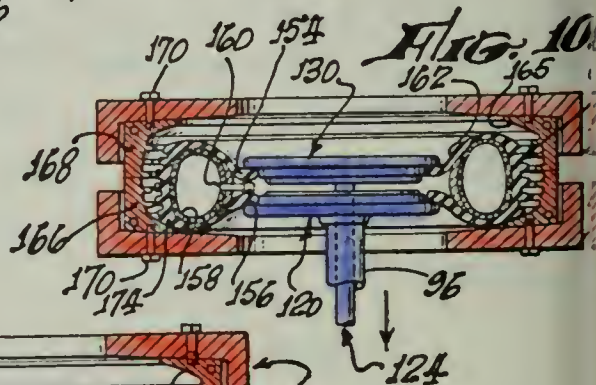
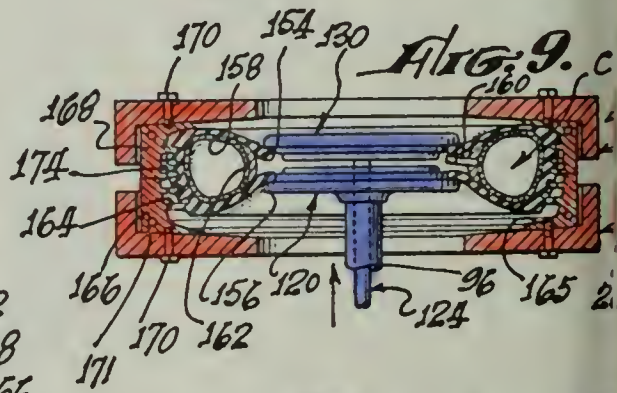
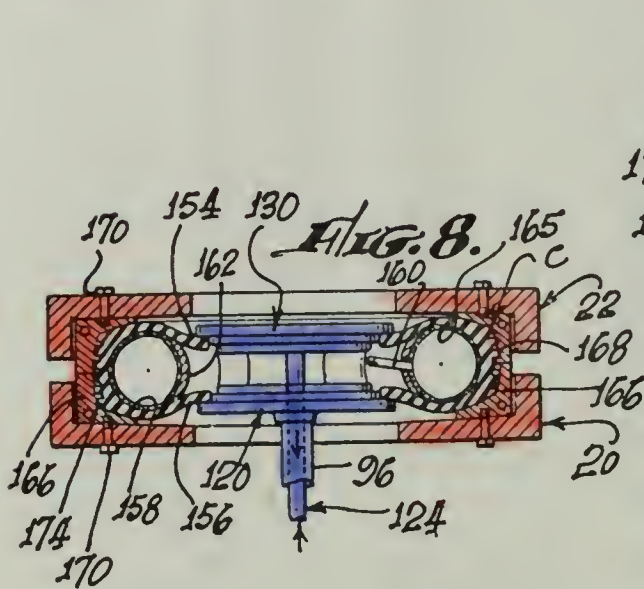
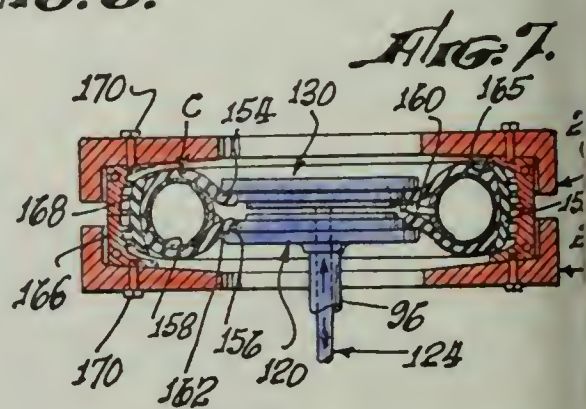
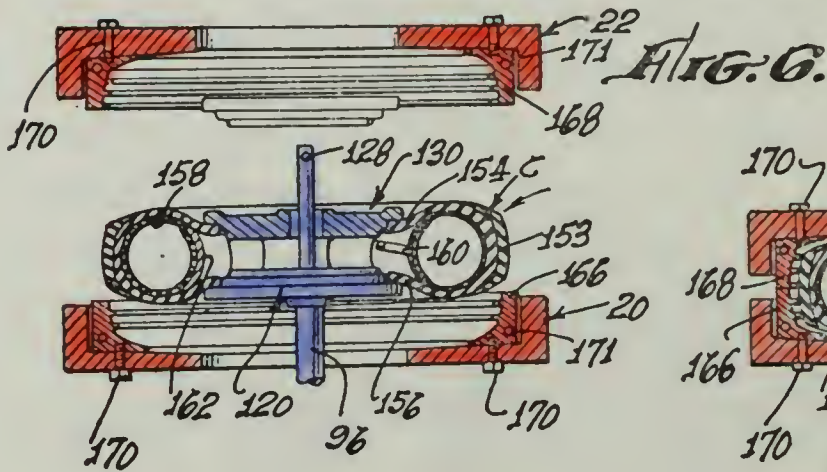
D. The Invention

The necessity of conducting the experimental program will be made apparent when the details of the invention are considered.

A copy of Patent No. 3,162,898 in suit appears in the Appendix hereto. For the convenience of the Court, however, there appears immediately herebelow copies of Fig. 1 and Fig. 2 of this patent. Referring to these drawings, a conventional tire retreading mold is shown colored red while the patented Fike Bead Aligner has been colored blue. It should be understood that the blue Bead Aligner is rigidly secured to the red tire retreading mold.



The operation of the patented Bead Aligner in conjunction with the tire retreading mold is shown in Fig. 6 through Fig. 11 of the drawings of the patent in suit. To facilitate this Court's understanding of such operation, these figures appear immediately herebelow. Again the tire mold parts are colored red while the Bead Aligner parts are colored blue.



Referring to the above drawings, it will be seen that in Fig. 6 upper half of the tire mold has been opened so as to receive the tire carcass C which is to be retreaded, such carcass having been provided with an unvulcanized band of rubber 153. The beads of the tire carcass C are engaged by upper bead wheel 130 and lower bead wheel 120 of the Bead Aligner mechanism.

Referring now to Fig. 7 the upper wheel 130 and lower wheel 120 are urged together by means of the power cylinders of the bead aligner to thereby squeeze the beads of the tire carcass C together and thereby reduce the outer diameter of the tire carcass whereby the bead wheels can be moved downwardly urging the carcass into the confines of the tire retreading mold.

Referring now to Fig. 8, the bead wheels 120 and 130 are separated thereby relaxing the beads of the tire carcass whereby it can flex into its normal expanded position tightly against the mold upper and lower halves of the tire retreading mold and exactly centered both horizontally and axially relative to the latter. The mold halves are then heated so as to vulcanize the previously unvulcanized tire retreading material 153 to the tire carcass C.

Referring now to Fig 9 and Fig. 10, at the conclusion of the vulcanizing operation it is necessary to loosen the treads of the completed tire from the upper and lower halves of the tire retreading mold. This is effected by moving the bead wheels 120 and 130 together and thereafter rocking the tire beads first

upwardly, then downwardly as shown in these two figures.

Finally, with the upper and lower bead wheels 130 and 120 urged together so as to again reduce the outer diameter of the vulcanized tire casing C, the tire is moved upwardly out of the confines of the lower mold half 20, the upper mold half 22 already having been moved to its open upper position.

Although the operational steps affected by the patented Bead Aligner may appear simple, the structural elements of the Bead Aligner and their cooperative relationship with the tire retreading mold are in fact quite complex. Thus, as shown in the patent drawings, the upper and lower bead wheels 130 and 120, respectively, are operated by means of a hollow tube 96 through which extends a long vertical shaft 124. The shaft and tube must be selectively moved both concurrently and separately to maintain the bead wheels in exact concentricity with the tire mold halves 20 and 22. This movement is effected by air cylinders 74 and 106 through valves 148 and 150 and interconnecting tubing as shown particularly in Fig. 1 of the patent drawings. A reading of the patent will also make it clear that such operation is complicated by the extreme high temperatures at which this equipment must operate. Moreover, the operators of tire retreading equipment are traditionally rough-handed (Fike Depo. 46).

E. The Experimental Program

In accordance with the Bead Aligner order, Sears from August 1958 until November 6, 1958 was periodically sent a series of invoices by Trutred. Sears paid Trutred on such invoices shortly after receipt since it was only possible for Trutred to go forward with the construction, installation and reworking of the Bead Aligners by having Sears pay for the Bead Aligners as they were manufactured (Record 272).

Commencing in August 1958 and continuing into November 1958, Trutred personnel under the personal supervision of the inventor Fike constructed and installed Bead Aligners embodying the patented invention on Sears tire molds. Such Bead Aligners were hand-built and were not constructed on a production basis (Record 271) (Fike Depo. 31).

These Bead Aligners were constructed in the Trutred shop one at a time rather than being constructed by the assembly line method and no jigs and fixtures were utilized as in the case of other Trutred products (Fike Depo. 32).

As the Bead Aligners were constructed they were promptly installed on the tire treading molds owned by Sears under the supervision of Fike. Fike had free access to the Sears retreading shops in which the Bead Aligners were installed and Sears employees reported to Fike each instance of a breakdown of Bead Aligner (Record 271). Upon receiving a report of a breakdown, Fike tried to determine whether the failure was due to abuse on the part of the mold operators or

due to a fault in his design (Fike Depo. 46). Where the breakdown resulted from a fault in design, Fike would remove the defective part from the broken-down Bead Aligner and redesign said part so as to overcome the design fault.

The redesigned part was then replaced in the Bead Aligner from which it had been removed and if such part then proved satisfactory identical replacement parts were made for each and every one of the approximately 248 Bead Aligners. Such replacement parts were then installed in these other Bead Aligners. Fike continued his watchdog activities with the Sears devices until approximately January 1959 at which time the breakdowns had substantially stopped and he believed his Bead Aligner design to be completed and proved (Record 272).

In connection with the experimental program it is important to note that as late as November 5, 1958 Fike sent a detailed report to Sears regarding three causes of breakdowns in the Bead Aligners and pointing out how such defects could be corrected (Record 214). Because of the critical nature of this report as demonstrating the existence of an actual experimental program, a copy thereof appears in the Appendix at page 1a.

F. Other Activities of Trutred Prior To The Critical Date

As set forth in Finding of Fact 10, Trutred advertised the Bead Aligner in the September, October and November 1958 issues of Tire, Battery & Accessory

News. The October 1958 advertisement included a photograph of the apparatus, described its advantages and offered a one year guarantee against defective material and workmanship. No proof was offered by defendant as to the actual date of publication of these advertisements.

As recited in Findings of Fact 11 (Record 327), Trutred displayed two of the Bead Aligners at its exhibit booth during a trade show October 11-15, 1958. These devices, however, could not be used in an actual tire retreading operation and instead were chrome-plated display units. The general mode of operation of the Bead Aligners, of course, without actual recapping of tires, was demonstrated at this convention and prices were quoted. The total operation of the Bead Aligners could not be demonstrated by these display units (Fike Depo. 56). No sales orders were taken of the Bead Aligners at this trade show and the door prize was not delivered, since at that time the Sears test program had not been completed and Trutred was not in production on the Bead Aligners for the general trade (Record 272) (Fike Depo. 57).

G. The Decision Of The Lower Court

Plaintiff filed papers opposing defendant's Motion For Summary Judgment including an Affidavit of the inventor Fike setting forth the background and details of the Sears' sale and testing program as outlined hereinbefore (Record 270). This Affidavit also stated the program could only be conducted if Sears paid for the Bead Aligners as constructed. The Affidavit concluded with the statement (Record 272):

“The sale and use of my tread aligners to Sears was a good faith use for experimental purposes and not a public use.”

Defendant did not file affidavits countering the Fike Affidavit and for the purpose of the Motion For Summary Judgment the District Court had to assume the facts of the Fike Affidavit to be true.

At the comparatively short hearing on Defendant's Motion For New Trial The Lower Court repeatedly referred to the magnitude of the number of Bead Aligners involved in the Sears' program as precluding any experimental use. Thus, note the following from the Reporter's Transcript Of Proceedings in December 12, 1966:

“THE COURT: Wait just a second.

Are you telling me that a sale of 248 units at one hundred — what was it — and sixty dollars a piece, amount to, as I figure it, over \$40,000, could be considered an experimental use?

MR. UTECHT: Certainly.

THE COURT: Have you any authority that goes anywhere near that?

MR. UTECHT: Yes. I cited one in my brief, a 10th Circuit Court of Appeals case decided last December, on page 5.” (Page 4)

* * * *

“THE COURT: That's a general phrase that the courts have used to state a general doctrine.

What were the facts of Universal as contrasted with the very sizable commercial sale of 200-odd units in this case.” (Page 5)

* * * *

“THE COURT: If you are saying that the inventor was under some economic pressure to accept this order from Sears or lose them as a customer, I can follow you.

But that is far different from saying that a sale of 248 machines is for experimental use.” (Pages 5 and 6)

“THE COURT: Well, Mr. Utecht, I can understand that pushing this exception to the extreme an inventor could conceivably sell one machine and put it in someone else’s location since they had the business under which it could be tested. But under those circumstances, if it were truly experimental, he would be there every day watching it and encountering the problems.

This is seven major cities and 248 machines, and I have a lot of trouble with the concept that such a sale of such magnitude can be for experimentation. Even as a matter of law, it seems to me, it is clearly not for experimentation, and that no evidence of intent could change that result.” (Pages 6 and 7)

After the hearing on the Motion For Summary Judgment the District Court Judge on December 15, 1966 directed a letter to counsel for both parties (Record 343). This letter is extremely important since it provides the actual rationale upon which the lower court rendered its decision that the patented invention was on sale over one year prior to the patent filing date. The letter sets forth the lower court’s reasoning as follows:

“I have decided to grant defendant’s motion for summary judgment submitted December 12,

1966. I will find that there are no contested issues of material fact. I will further find that uncontested facts establish 'public use or on sale' within the meaning of Title 35 U.S.C. § 102(b).

It seems to me that the admitted sale of 248 machines prior to the critical date, precludes any defense based on experimentation and when such large-scale commercial activity has occurred, the alleged intention of the inventor that all of such machines would be used for experimentation, is irrelevant." (Emphasis added)

Findings of Fact, Conclusions of Law and a Judgment were prepared by defendant embodying the rationale of the aforementioned letter from the District Court. The important Conclusion of Law upon which the Judgment of non-validity was based is as follows:

"B. The activities of Trutred prior to the critical date of October 29, 1958 with respect to uses and sales of the apparatus ultimately patented in U. S. Patent No. 3,162,898 placed the alleged invention in public use and on sale in this country more than one year prior to the date of application in the United States within the meaning of 35 U.S.C. Sec. 102(b). To sustain the validity of the patent in light of these activities would result in a circumvention of both the terms and policy of that statutory provision. *Cataphote Corp. v. DeSoto Chemical Coatings, Inc.* (9th Cir. 1966) 356 F.2d 24."

SPECIFICATION OF ERRORS

1. Conclusions of Law B and C are in error in holding the patent in suit invalid because of a public use or sale in this country more than one year prior to

the date of application of the patent within the meaning of 35 U.S.C. 102(b).

2. The District Court was in error in basing its ruling of invalidity on the sale of the 248 Bead Aligners prior to the critical date, completely disregarding the intention of the inventor that such devices were undergoing experimentation, merely because such sale according to the Court involved "large-scale commercial activity" (The District Court's Letter of December 15, 1966 to counsel, Record 343).

SUMMARY OF ARGUMENT

35 U.S.C. 102(b) requires that an inventor file a patent before his invention has been in use or on sale for over one year or the patent may be held invalid.

35 U.S.C. 112 requires that an inventor show his best form of the invention in the patent application or the patent may be held invalid.

The doctrine of "experimental use" permits an inventor to test and develop the best form of his invention without invalidating his patent as being "in use" or "on sale" under 35 U.S.C. 102(b).

In this case, the best form of the invention could only be developed by making the sale to Sears and the Sears' program incorporated all of the classical elements of "experimental use."

The number of machines involved in an "experimental use" is immaterial as long as the testing is carried out in good faith. The District Court in this case, however, erroneously held to the contrary.

The District Court erred in substituting for the true fact of the inventor's motivation in conducting the Sears' experimental program the Court's feeling as to what it assumed was his motivation.

In any event, the motivation of the inventor in conducting the Sears' program presented an unresolved question of fact precluding the District Court from properly rendering a Motion For Summary Judgment.

ARGUMENT

I. The Rationale of 35 U.S.C. 102(b)

35 U.S.C. 102(b) states:

“A person shall be entitled to a patent unless the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.”

The rationale for the requirement that the inventor file his patent application within one year after the first public use or sale was set forth in the early case of *Pennock v. Dialogue*, 27 U.S. 1, 19 wherein Mr. Justice Story stated:

“If an inventor should be permitted to hold back from the knowledge of the public the secrets of his invention; if he should, for a long period of years, retain the monopoly, and make and sell his invention publicly, and thus gather the whole profits of it, relying upon his superior skill and knowledge of the structure; and then only, when the danger of competition should force him to

secure the exclusive right, he should be allowed to take out a patent, and thus exclude the public from any further use than what should be derived under it, during his 14 years; it would materially retard the progress of science and the useful arts, and give a premium to those who would be least prompt to communicate their discoveries.”

Specifically, with regard to 35 U.S.C. 102(b), this Court in the recent *Cataphote* case stated (356 F.2d Page 25):

“The express purpose of this statutory provision was to prevent the extension of the monopoly permitted by the patent laws by requiring an inventor to make timely application so that the patent period might commence to run without undue delay.”

Under the provisions of 35 U.S.C. 102(b) an inventor must file his patent application within one year after he first places his invention on sale. If he files after this time his patent can be held invalid. *It should be noted, however, that an inventor must also comply with 35 U.S.C. 112 or his patent can be held invalid.*

2. The Rationale of 35 U.S.C. 112

35 U.S.C. 112 cautions an inventor that:

“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and *shall set forth the best mode contemplated by the inventor of carrying out his invention.*” (Emphasis added)

The rationale behind 35 U.S.C. 112 was concisely set forth in the case of *In re Nelson & Shabica* (CCA June 1960) 282 F. 2d 172 wherein the Court stated:

“The basic purpose of the requirement that the specification contain a written description of the invention is to put those skilled in the art in possession of sufficient knowledge to enable them to practice the invention. One cannot read the wording of Section 112 without appreciating that strong language has been used for the purpose of compelling complete disclosure. There always exists, on the part of some people, a selfish desire to obtain patent protection without making a full disclosure, which the law, in the public interest, must guard against. Hence Section 112 calls for description in ‘full, clear, concise, and exact terms’ and the ‘best mode’ requirement does not permit an inventor to disclose only what he knows to be a second best embodiment, retaining, the best for himself.”

The courts have often applied the sanctions of 35 U.S.C. 112. By way of example, this Court in *Moist Cold v. Johnson* (October 1957) 249 F. 2d 246 held a specification to be fatally deficient stating:

“If there was no disclosure of the means by which the invention was accomplished in the patent claims as aided by the specifications, there could be no valid invention. The trial judge ruled that 35 USCA 112 had not been met because of a failure to disclose the essential thin coil or other extended surface coil in the specification.”

See also *Van Brode v. Cox* (CA 9 1960) 279 F.2d 313 wherein this court held a patent invalid for insufficient disclosure.

In the recent case of *Flick-Reedy Corp. v. Hydro-Line Mfg. Co.* (September 1965) 351 F.2d 546 the Seventh Circuit Court of Appeals held a patent invalid as failing to comply with 35 U.S.C. 112 stating:

“The constitutional provision and implementing patent law are intended to reward with a 17 year monopoly an inventor who ‘refrains from keeping his invention a trade secret.’ *Universal Oil Products Co. v. Globe*, 322 US 471, 484, (1944). The quid pro quo for the monopoly is disclosure which will enable those skilled in the art to practice the invention at the termination of the monopoly, and to warn the industry concerned of the precise scope of the monopoly asserted. To accept the monopoly and withhold the full disclosure of the ‘*best mode contemplated by the inventor*,’ which will result in a contribution to the common good upon the expiration of the monopoly is the ‘selfish desire’ against which 35 U.S.C. 112 is directed. *Application of Nelson*, 280 F.2d 172, 184, 126 USPQ 242, (CCPA 1960).” (Emphasis added)

3. The Inventor In This Case Was Placed Between The Scylla Of 35 U.S.C. 102(b) And The Charybdis Of 35 U.S.C. 112.

As set forth hereinbefore, in the summer of 1958 the inventor Fike had tested two Bead Aligners prototypes and believed his basic inventive concept to be correct. Because of the complex mechanical functions of his Bead Aligners, the severe working conditions to which they were exposed and the variety of tires and tire molds involved, Fike could not make a final

determination as to whether or not his combination solved the problem without undertaking a “crash” program under varying working conditions. The Sears’ offer to immediately purchase some 248 Bead Aligners was then made.

At this point of time Fike could have filed a patent application disclosing the construction of his Bead Aligner employed in the two prototypes. By such filing he would have complied with 35 U.S.C. 102(b). Assuming, however, that the construction of his two prototypes later turned out to be not the “best mode” of his invention, he would either be put to the time and expense of filing a second patent application disclosing such “best mode” or risk having his patent held invalid for failure to comply with 35 U.S.C. 112. It should be remembered that Fike’s company Trutred was a small business and could not afford the luxury of several patent filings on a single product.

Under these circumstances Fike elected to withhold the immediate filing of a patent and instead in August 1958 accepted the Sears’ offer.

By hindsight it would now appear Fike’s better choice would have been immediately file a patent application. But suppose as a result of the experimental program Fike’s original design proved unsatisfactory and he had to develop a different ultimate construction for the Bead Aligner than that of his two prototypes. Under these circumstances it is quite possible the defendant herein would be urging invalidity of the resulting Bead Aligner patent as failing to comply with 35 U.S.C. 112.

4. The Doctrine Of "Experimental Use" Safeguards The Rights Of Inventors Such As Fike While Protecting The Public Against Unwarranted Monopolies.

It is well established that where an inventor is in good faith experimenting so as to perfect or test his invention, his failure to file within one year after a public use or sale of the invention is not fatal. A recent case directly in point is *Universal Marion Corp. v. Warner & Swasey* (CA 10 December 30, 1965) 354 F.2d 541 wherein the Court held:

“It is contended that the use of the early Ferwerda machines constitutes a public use within the meaning of the statute. It is well-settled that all uses do not necessarily constitute a public use. Use by an inventor in good faith for the purpose of testing his apparatus or device for experimental purposes is not public use within the scope of the statute, even though incidental to such use he derives some financial return. *Merrill v. Builders Ornamental Iron Co.*, 197 F.2d 16; *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381.”

Another case in point is *Merrill v. Builders Ornamental Iron Co.*, (CA 10 1952) 197 F.2d 16 wherein the Court held:

“Whether use of an invention is public or private does not necessarily depend upon the number of persons to whom its use is known. The determinative factor is whether the use is made in good faith for purpose of experiment in testing the qualities and operation of the device or ap-

paratus. (Citing: *Elizabeth v. Pavement Co.*, 97 US 126; *Egbert v. Iippman*, 104 US 333; *Smith & Griffs Mfg. Co. v. Sprague*, 123 US 242 and *Electric Storage Battery Co. v. Shimadzu*, 307 US 5). And use by the inventor in good faith for the purpose of testing his apparatus or device for experimental purposes is not public use within the scope of the statute, even though incidental to use he derives some financial return. Good faith use of an invention for such purpose is not changed in character merely by the receipt of incidental profit or gain.”

The cases upholding experimental use nearly all refer to the early *Elizabeth v. Pavement Co.* case cited at 97 US 126. In the *Elizabeth* case the subject matter of the patent was a pavement construction. A length of pavement embodying the invention was publicly used for six years before a patent application was filed. The inventor claimed that such protracted public use was necessary in order to properly test the pavement under actual traffic conditions, such traffic conditions, in fact, being most severe. The Supreme Court sustained the patent on the basis of the “experimental use” doctrine stating:

“Such use is not a public use, within the meaning of the statute, so long as the inventor is engaged, in good faith, in testing its operation. He may see cause to alter it and improve it or not. His experiments will reveal the fact whether any and what alterations may be necessary. If durability is one of the qualities to be attained, a long period, perhaps years may be necessary to enable the inventor to discover whether his purpose is accomplished. And though, during all that period,

he may not find that any changes are necessary, yet he may be justly said to be using his machine only by way of experiment; and no one would say that such a use, pursued with a bona fide intent of testing the qualities of the machine, would be a public use, within the meaning of the statute. So long as he does not voluntarily allow others to make it and use it, and so long as it is not on sale for general use, he keeps the invention under his own control, and does not lose his title to a patent.

It would not be necessary, in such a case, that the machine should be put up and used, only in the inventor's own shop or premises. He may have it put up and used in the premises of another, and the use may inure to the benefit of the owner of the establishment. Still, if used under the surveillance of the inventor, and for the purpose of enabling him to test the machine and ascertain whether it will answer the purpose intended, and make alterations and improvements as experience demonstrates to be necessary, it will still be a mere experimental use and not a public use, within the meaning of the statute."

5. The Sears Program Falls Squarely Within The "Experimental Use" Doctrine.

From the facts set forth hereinbefore, it will be apparent that the facts in this case clearly establish an experimental use. The Bead Aligners were not on general sale and only a sufficient number to comply with the Sears order were constructed. These devices were not constructed on a production basis but

were hand-built without the use of jigs and fixtures, as in the case of the other Trutred products. The completed Bead Aligners were installed on the Sears tire molds under the personal supervision of the inventor Fike. When the Bead Aligners broke down (as was expected by the inventor), he immediately determined the reason for such breakdown and redesigned and replaced defective parts in the particular Bead Aligner. When he determined his solution for preventing the breakdown was successful, he provided all of the other Bead Aligners with the redesigned parts. That the experimental program was in effect on the critical date of October 28, 1958 was clearly established by the written report of Fike to Sears on November 5, 1958.

Because of the summary disposition of this case, there is nothing in the record to indicate whether or not Trutred made any profit from the Sears program. Even assuming a profit was made, however, it would only have been incidental to the experimental use. Thus, the experimental nature of the Sears program would not be changed in character according to the doctrines of the cases cited hereinabove.

It should also be noted that the Sears program did not result in a long delay with respect to the critical date for filing the patent application. Instead, the time between the first delivery of a Bead Aligner to Sears and the critical date was less than three months. Thus, it cannot be said that the patent period commenced to run with "undue delay" as condemned by this Court in the *Cataphote* case (*Supra*).

6. The Lower Court Failed To Appreciate That Whether One Machine Or 248 Machines Were Involved In The Experimental Program Was Immaterial So Long As The Use Of Such Machines Involved A Good Faith Experimental Use.

As pointed out hereinbefore, the District Court placed great emphasis on the fact that the Sears program involved some 248 machines. It is clear from the remarks of the Court at the hearing on Defendant's Motion for Summary Judgment and Paragraph 2 of the Court's Letter to Counsel (Record 343) that the District Court felt the fact that many Bead Aligners were involved in the program rather than one or two devices meant the difference between experimental use and public use. The District Court gave no reason for its conclusion and the logic thereof is difficult to understand.

In the present case the inventor attempted to complete the testing of his invention just as soon as possible. The only way in which this could be accomplished was by installing such invention on many different tire molds exposed to different working conditions, tire types and personnel. Although some 248 units were involved, the design of each was identical and there was in fact but a single sale to a single customer. There was not an unrestricted sale to the general public. Although many units were involved, the changes were made to each and every one of such units. As was set forth in *Merrill v. Builders Ornamental Iron Co.* (Supra), the determinative factor establishing the existence or non-existence of an experimental use

“is whether the use is made in good faith for purpose of experiment in testing the qualities and operation of the device or apparatus.”

The determinative factor should be the same whether one machine of a single design or several machines of the same design are undergoing testing. Either the inventor is conducting an experimental program or he is conducting a sales program. To arbitrarily limit the number of machines which can be used in an experimental program would not be logical, and as noted hereinbefore could readily extend the time necessary to complete the experimental program.

7. In The Present Case The Only Evidence Before The District Court Clearly Established An Experimental Use And It Was Error For The Court To Ignore Such Evidence.

As noted hereinbefore, pursuant to the rules concerning summary judgments, plaintiff in opposition to defendant's motion submitted an affidavit of the inventor Fike. This affidavit set forth the necessity for conducting the experimental program as well as the details of the conduct of such program. This affidavit also stated that Trutred did not have sufficient capital to conduct the experimental program and it was only possible to go forward with such program by having Sears pay for the Bead Aligners as they were constructed. Finally, the Fike affidavit stated that:

“The sale and use of my tread aligners to Sears was a good faith use for experimental purposes and not a public use.”

Thus, the intent of the inventor Fike to conduct an experimental program was clearly established. The Court, however, held the inventor's intent to be irrelevant on the sole basis that the program involved 248 machines (Letter to Counsel, Record 343).

This Court in the *Cataphote* case, cited by the District Court in this case as authority for its holding, clearly enunciated the guidelines for deciding whether a public use or an experimental use has taken place as follows:

“The resolution of the sole issue raised regarding Section 102(b) depends entirely on a determination, from the totality of evidence presented by both parties, of *the nature of the acts* committed prior to the critical date and *the purpose that motivated* the commission of those acts.” (Emphasis added)

Applying the above law to the present case, there could be no conflict with respect to the “nature of the acts” since such conflict would raise a material issue of fact thereby precluding the granting of a motion for summary judgment. With regard to “the purpose that motivated” the commission of those acts, plaintiff provided the affidavit of the inventor Fike clearly establishing the fact that his motivation for conducting the Sears program was experimental testing and not a public use. The District Court, however, ignored the inventor's motivation as set forth in his affidavit and substituted therefor the District Court's feeling as to what it assumed was the inventor's motivation. On the basis of such substituted fact the District Court held the Sears program to constitute a sale.

Such action on the part of the District Court was clearly erroneous.

8. Summary Judgment Was Not Proper In Any Event Since The Fact Of The Inventor's Motivation Was Contested.

It is well established in this Circuit that a Motion for Summary Judgment should not be granted where there exists even a single genuine issue of fact and that all doubts must be resolved against the moving party. This doctrine has been followed in many Ninth Circuit of Appeals decisions including *Sequoia Union High School District v. United States*, 245 F.2d 227, *Neff Instrument Corp. v. Cohu Electronics*, 269 F.2d 668 and *Griffith v. Utah Power*, 226 F.2d 66.

The following language of this Court from *Cee-Bee Chemical v. Delco*, 263 F.2d 150 in reversing a motion for summary judgment in a patent action is particularly in point:

“If the conclusions reached by the trial court required it to first resolve a genuine issue as to a material fact, the case should not have been disposed of on a motion for summary judgment.”

As noted hereinbefore, the fact as to whether the inventor's motivation in conducting the Sears program was experimental testing or the conduct of a sales campaign was the key as to whether the patent in suit should be held valid or invalid under 35 U.S.C. 102(b). Plaintiff submitted an affidavit establishing the fact that the inventor's motivation was experimental testing and not a public use. Accordingly, there

existed an unresolved question of fact which precluded the District Court from properly granting the Motion For Summary Judgment.

CONCLUSION

The District Court erred in granting defendant's Motion For Summary Judgment holding the patent in suit invalid.

The District Court's holding should be reversed and the matter remanded to the District Court for trial.

Respectfully submitted,

FULWIDER, PATTON, RIEBER,
LEE & UTECHT

By Francis A. Utecht
*Attorneys for Plaintiff-Appellant
Super Mold Corporation*

CERTIFICATE

I certify that, in connection with the preparation of this Brief, I have examined Rules 18 and 19 of the United States Court of Appeals for the Ninth Circuit, and that in my opinion, the foregoing Brief is in full compliance with those rules.

.....
Francis A. Utecht

APPENDIX A

November 5, 1958

H. A. Barron

Sears Roebuck & Company
Chicago 7, Illinois

SUBJECT: *5/8 CENTER SHAFT IN TRUMATIC ALIGNER*

Some of these shafts have had occasion to blow out of aligner. After careful analysis we have found that the $\frac{1}{2}$ " sel loc nut which holds the piston cup on said shaft in lower cylinder have unscrewed due to short thread. We believe that you will have very few in number to do this. (To repair — remove bottom cylinder casting from lower cylinder, reinsert shaft aligner, replace cup and washer, replace and tighten $\frac{1}{2}$ " loc nut, hold shaft above during tightening process with pipe wrench. Center punch end of the shaft where sel loc is, in order to upset thread. This will eliminate any further backing off of nut.

SUBJECT: *BREAKING OF BOTTOM ALUMINUM ALIGNER WHEEL*

This is caused by mishandling unit during the loading operation when tire is thrown in mold. The bottom aligner wheel and center shaft should be down but most important *DO NOT SLAM*

TIRE AND RIM IN MOLD. Pick it up and set it in. This may take a fraction of a second longer but you will not notice it. If this is followed you will have no further breakage of bottom wheels.

SUBJECT: *BENDING 5/8 CENTER SHAFT IN ALIGNER*

We believe that the bending of this shaft comes in loading of mold. The 5/8 shaft as well as bottom aligner wheel should be down in loading and again we cannot stress too strongly that caution should be used in loading mold. *DO NOT THROW TIRE AND RIM IN.* We feel that if this is followed you will have no more bending of shaft.

Very truly yours,

TRUTRED TIRE MOLDS INC.

L. T. Fike

Vice President

LTF:as

cc: Anderson, LA

Anderson, Chi.

Anderson, Dallas

Tire Ind., Akron

Eastern Tire, N.J.

Westside, N.J.

Farwest, Seattle

EXHIBIT 17

APPENDIX B

Dec. 29, 1964

L. T. FIKE

3,162,898

APPARATUS FOR USE IN RETREADING TIRES

Filed Oct. 29, 1959

3 Sheets-Sheet 1

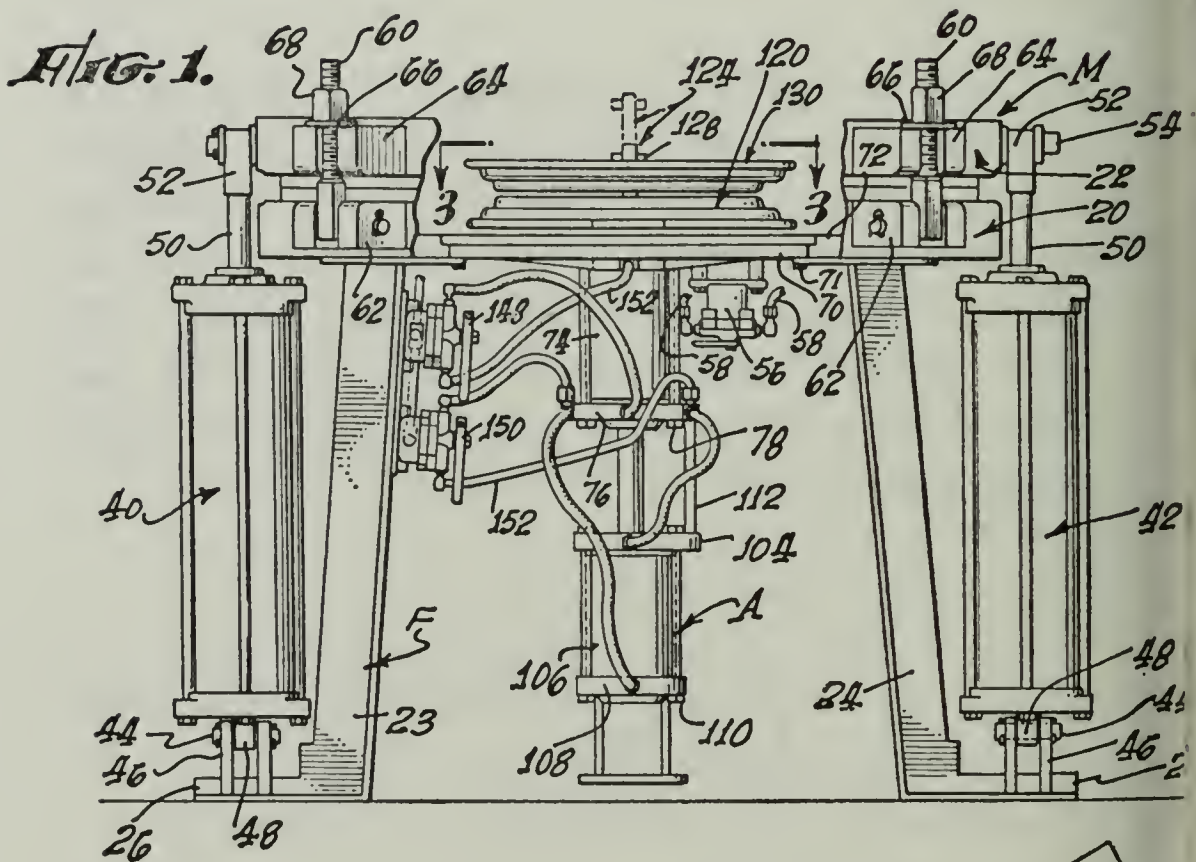
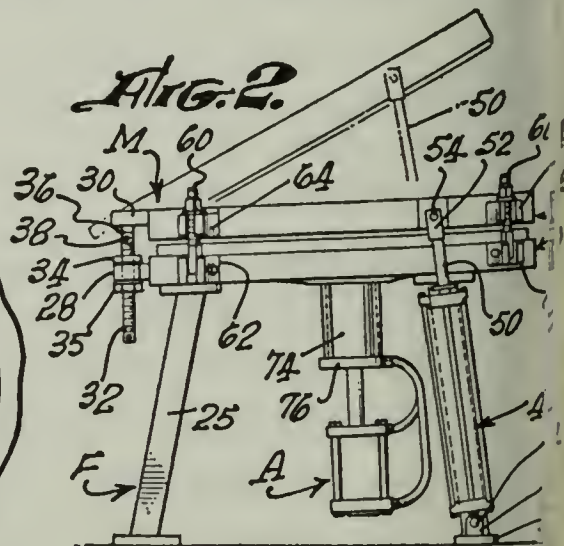
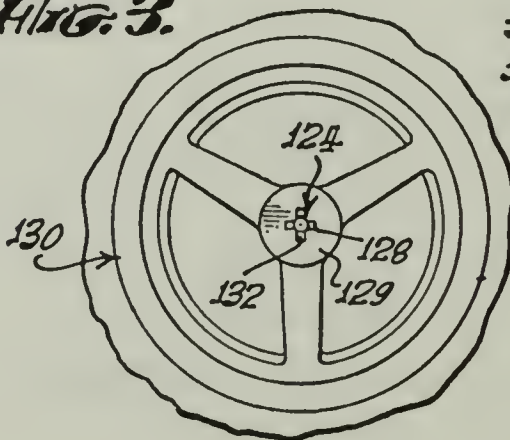


FIG. 3.



INVENTOR
LOUIS T. FIKE,

BY
Fulwider, Mattingly & Huntley
ATTORNEYS

Dec. 29, 1964

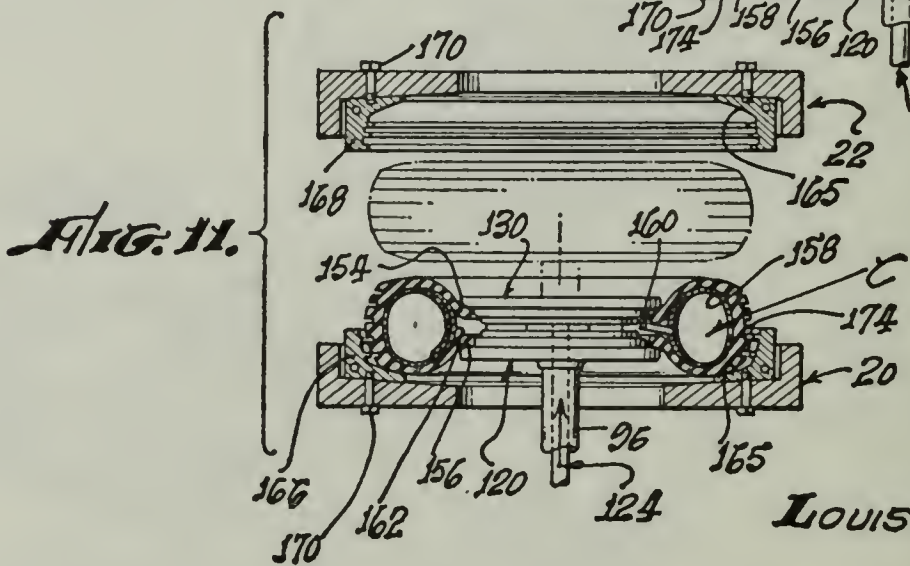
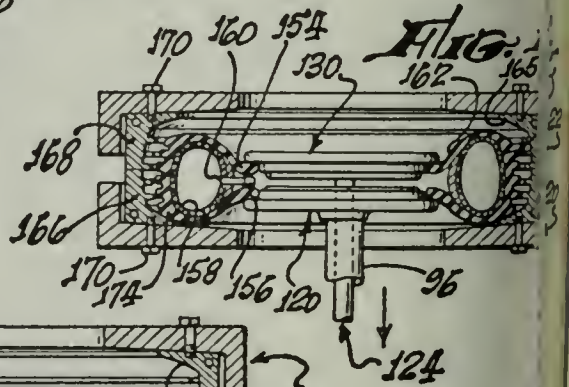
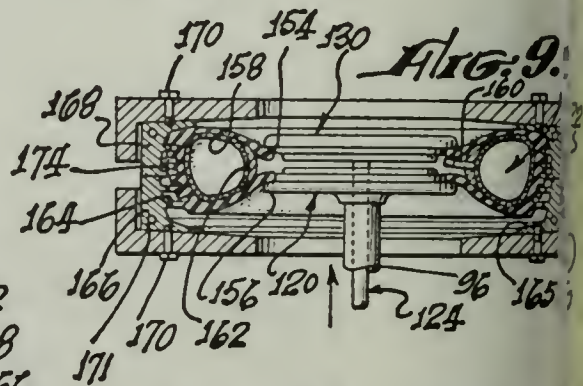
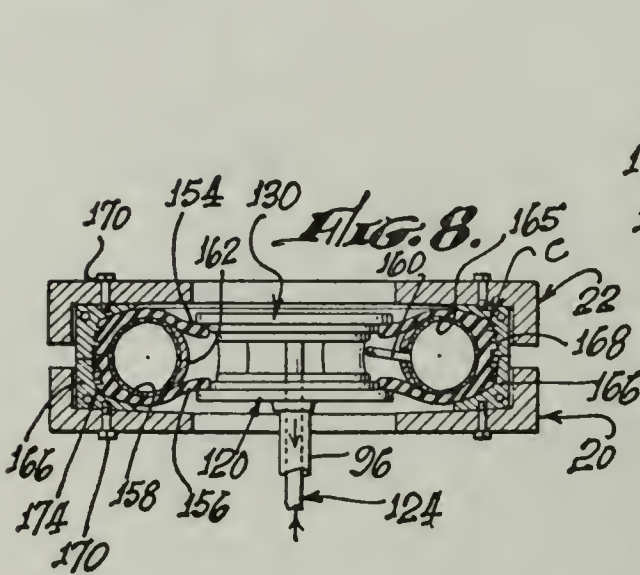
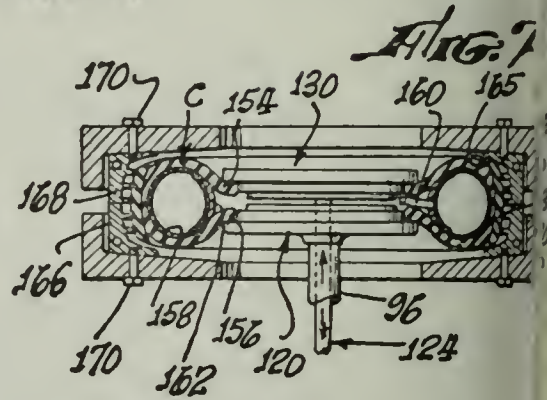
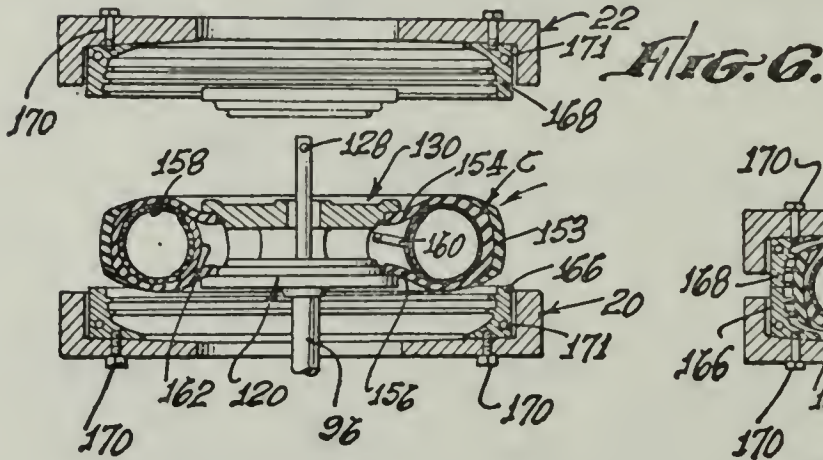
L. T. FIKE

3,162,898

APPARATUS FOR USE IN RETREADING TIRES

Filed Oct. 29, 1959

3 Sheets-Sheet 1



LOUIS T. FIKE
INVENTOR

BY
Fulwider, Mattingly
Huntley
ATTORNEYS

United States Patent Office

3,162,898

Patented Dec. 29, 1964

1

3,162,898

APPARATUS FOR USE IN RETREADING TIRES

W. T. Fike, Los Angeles, Calif., assignor, by mesne assignments, to Super Mold Corporation of California, Inc., a corporation of California

Filed Oct. 29, 1959, Ser. No. 849,550

12 Claims. (Cl. 18—18)

The present invention relates generally to tire retreading apparatus and is particularly directed to apparatus which will consistently provide retreaded tires having uniform treads.

Generally, in retreading a worn tire casing the outer surface of such casing is first buffed with a wire brush or the like. Then a band of unvulcanized rubber is adhered to the outer periphery of the tire casing and a matrix is positioned within the matrix of a mold. The mold imparts heat to the casing so as to bond the unvulcanized band thereto, with the radially inwardly extending ribs of the matrix also forming treads in the casing during the heating operation.

A representative mold usable with the apparatus embodying the present invention includes upper and lower mold halves that are pivotally connected at their rear portions. Each half is provided with a matrix half, the latter being radially inwardly engaging the upper and lower portions of the casing during the heating operation. The diameter of the cavity defined by the upper and lower matrix halves corresponds to the outer diameter of the retreaded tire, with the matrix ribs extending radially inwardly beyond the outer diameter of the unvulcanized band. The apparatus of the present invention serves to initially reduce the diameter of the casing in order that the latter may be positioned within the confines of the cavity defined by the matrix in exact horizontal alignment with the tire. This eliminates any possibility of the casing being positioned crookedly relative to the matrix. It has been determined that misalignment of the casing relative to the matrix as the casing is positioned within the cavity is a primary cause of crooked treads in the retreaded tire. The two halves of the mold are locked against vertical separation during the heating operation by suitable lock means. The aforementioned reduction in casing diameter provided by the present apparatus permits these lock means to be readily applied to the mold halves. During the heating operation the apparatus of the present invention positively maintains the casing aligned with the matrix so as to assure uniform treads in the completed tire. After the casing has been heated so as to form the treads thereon, the apparatus of the present invention serves to break the casing loose from the matrix halves in order that the completed retreaded tire may be readily removed from the matrix. In this apparatus lifts the upper mold half free of the lower mold half and thereafter effects upward ejection of the completed retreaded tire from the lower matrix half.

It is a major object of the present invention to provide an improved apparatus for use with a heating mold in retreading a tire.

A further object of the present invention is to provide apparatus of the aforescribed nature adapted to effect radial and vertical movement of a casing relative to a matrix during a tire retreading operation.

An additional object of the present invention is to provide apparatus for use with a retreading mold having upper and lower halves, with such apparatus effecting movement of the upper mold half relative to the lower half to effect radial and vertical movement of the casing relative to the mold's matrix.

A further object is to provide apparatus of the aforescribed nature which permits the mold halves to be locked together by lock means without requiring a sepa-

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rate press for exerting a squeezing force upon such mold halves.

It is another object of the present invention to provide apparatus of the aforescribed nature which is relatively simple of construction and rugged of design whereby it may afford a long and trouble-free service life.

Yet an additional object of the present invention is to provide apparatus of the aforescribed nature which is economical and foolproof of operation, and which affords a considerable savings in the time required to effect a tire retreading operation.

These and other objects and advantages of the present invention will become apparent from the following detailed description when taken in conjunction with the appended drawings wherein:

FIGURE 1 is a front elevational view of a preferred form of apparatus embodying the present invention;

FIGURE 2 is a side elevational view in reduced scale showing said apparatus;

FIGURE 3 is a top plan view of a top bead ring utilized in said apparatus;

FIGURE 4 is a central vertical cross-sectional view showing the tire casing engaging portion of said apparatus;

FIGURE 5 is a fragmentary vertical sectional view showing a tire casing to be retreaded by said apparatus and an air bag utilized to hold such casing expanded within a matrix; and

FIGURES 6 through 11 are central vertical sectional views showing the mode of operation of said apparatus.

Referring to the drawings and particularly FIGURES 1 and 2 thereof, a preferred form of apparatus embodying the present invention includes a mold M having a fixed lower half 20 and a movable upper half 22. The lower mold half 20 is rigidly affixed to the upper end of a frame F having plurality of legs (preferably three) designated 23, 24 and 25. The lower portion of the legs are provided with horizontally extending feet 26. The rear portion of the lower mold half 20 is formed with a lug 28. The lug 28 is in vertical alignment with a complementary lug 30 formed on the upper mold half 22 when the two halves are in overlying relationship. The lug 28 supports the lower portion of a generally vertically extending externally threaded adjustment post 32, with adjustment nuts 34 and 35 being provided for such post immediately above and below this lug. The upper portion of the adjustment post 32 is hingedly affixed to a pin 36 that depends from the lug 28 by a horizontal pin 38 whereby the upper mold half 22 may have its front end pivoted upwardly to the open position shown in phantom outline in FIGURE 2. The adjustment post 32 permits the spacing between the upper and lower mold halves to be adjusted to compensate for the particular thickness of the tire matrix utilized with the mold M.

Inasmuch as the upper mold half 22 is of heavy construction, power-operated means are provided to effect movement of the upper mold half between its closed position shown in solid outline in FIGURE 2 and its open position shown in phantom outline therein. Such power-operated means takes the form of a pair of air operated cylinder and piston units 40 and 42 disposed at opposite sides of the front legs 23 and 24. The lower end of each cylinder is pivotally affixed to the foot 26 of its respective leg by means of horizontally extending pivot pins 44. The pivot pins 44 extend between upstanding bifurcations 46 formed on each foot and a depending ear 48 formed at the lower central portion of each cylinder. A piston rod 50 extends upwardly out of each of the cylinders and piston units. The upper end of each piston rod 50 is affixed to a bearing element 52. Both bearing elements pivotally receive a horizontally extending pin 54, with such pins extending horizontally outwardly from the opposite sides of the upper mold half 22. Air is

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admitted to and discharged from cylinder and piston units 40 and 42 by conventional means. Thus, there is provided a three-way valve 56 connected to a source of pressurized air (not shown). This valve 56 is mounted at the front right-hand portion of the lower mold half 20 at a point spaced below such lower mold half. The valve 56 is connected to the upper and lower ends of the cylinders and piston units by suitable flexible conduits 58.

It generally requires approximately 45 minutes for a casing to be cured within the mold M. Accordingly, it is desirable to use means other than the cylinder and piston units 40 and 42 to maintain the upper mold half 22 locked tightly against the lower mold half 20 during the curing operation. Accordingly, suitable lock means such as a plurality of lock bolts 60 are interposed between the upper and lower mold halves. The lower ends of the lock bolts 60 are pivotally mounted between radially extending bifurcations 62 formed on the periphery of the lower mold half 20. The intermediate portion of these lock bolts 60 are received between complementary bifurcations 64 which extend radially outwardly from the upper mold half 22. The bifurcations 62 and 64 are rigidly affixed at their radially inner ends to their respective mold halves. The upper portion of each lock bolt 60 is adapted to receive a washer 66 and a nut 68. When the lock bolts 60 are swung upwardly to their position shown in FIGURE 1, the nuts 68 will be tightened so as to lock the upper mold half 20 against upward separation from the lower mold half 20. Various other lock means may be utilized in lieu of the aforescribed, as for example, a circumferential clamp of the type shown in Patent No. 2,903,742, issued September 15, 1959.

The apparatus of the present invention also includes aligner unit A that is centrally disposed relative to the mold M. Referring now additionally to FIGURES 3 and 4, the adapter unit A includes an adapter disc 70, the radially outer end of which is rigidly affixed by bolts 71 to horizontally extending arms 72 formed on the upper end of the legs 23, 24 and 25. The adapter disc 70 is therefore fixed relative to the frame F. An upper, fixed fluid cylinder 74 depends coaxially from the adapter disc 70. The lower end of this upper cylinder 74 is closed by means of a closure plate 76. This closure plate 76 is held fixed relative to the lower end of the upper cylinder by means of a plurality of vertically extending tie bolts 78, the upper ends of such tie bolts being threaded into sockets 80 formed in the adapter disc 70.

The adapter disc 70 is centrally formed with a bore 82. This bore 82 slidably receives the upper portion 84 a vertically extending, generally tubular shaft, generally designated 86. The intermediate portion of this shaft 86 is formed with a recess 88 for receiving an upper piston 90. This piston 90 is vertically slidably disposed within the upper cylinder 74. The lower end of the piston 90 is retained in place by means of a retaining nut 92, the latter engaging threads 94 formed on the shaft 86 below the recess 88. The portion of the shaft 86 below the threads 94 is of reduced diameter as compared to the upper portion 84 of the shaft. This lower shaft portion 96 vertically slidably extends through a coaxial bore 98 formed in the closure plate 76. The lower end of the shaft 86 is formed with threads 100. These threads 100 are engaged with complementary threads formed in a socket 102 that is coaxial with a plug 104. The plug 104 defines the upper closure of a lower fluid cylinder 106. The lower end of the lower cylinder 106 is closed by a bottom closure plate 108. The bottom closure plate 108 is held in place by means of a plurality of tie bolts 110. The upper ends of these tie bolts 110 are threadably received by the plug 104. A lower piston 111 is vertically slidably disposed within the lower cylinder 106.

The plug 104 is rigidly affixed to the lower end of a plurality of upstanding guide rods 112. The guide rods 112 are vertically slidably received within complementary

guide holes 114 formed in the radially outer portion of the bottom closure plate 108. With this arrangement, vertical reciprocation of the shaft 86 will be directly transferred to the lower cylinder 106 whereby the shaft 86 will undergo reciprocation concurrently with the shaft 111.

The upper end of the shaft 86 is formed with a neck 116. This neck 116 telescopically receives the bore 118 formed in the hub 119 of a lower bead wheel 120. Accordingly, vertical movement of the shaft 86 will be directly transferred to this lower bead wheel 120.

The bore 122 of the tubular shaft 86 vertically receives a rod generally designated 124. The end of this rod 124 is affixed to the lower piston 111 by means of a nut 126.

The upper end of the rod 124 is formed with a stop pin 128 that extends radially outwardly from opposite sides of the rod. The upper end of the rod 124 is removably engageable with the hub 129 of a lower bead wheel 130. Thus, referring to FIGURE 3 the hub 129 is provided with a horizontally extending slot 132 that is slightly larger in dimensions than the stop pin 128. Accordingly, when the slot 132 is aligned with the stop pin 128, the hub 129 may be lowered over the upper end of the rod 124. Thereafter, the upper bead wheel may be rotated 90 degrees to its position shown in FIGURE 3 and downward movement of the rod 124 will then be transferred to the upper bead wheel 130.

Preferably, the upper and lower bead wheels 130 and 130 will be usable with two or more tire casing sizes. Accordingly, as indicated in FIGURES 4 and 5, each bead wheel is formed with a first annular groove 144 adapted to receive a first tire size, as for example, a 15 inch tire. Radially inwardly of each groove 144 is formed a second annular groove 146 of lesser diameter. This second groove 146 is adapted to receive a smaller diameter tire, as for example, a 14 inch tire.

Air is supplied to the interior of the upper and lower cylinders 74 and 106 by means of a pair of conventional air valves 148 and 150, respectively. As indicated in FIGURE 1, these air valves 148 and 150 may be rigidly affixed to the leg 23 of the frame F. These air valves receive pressurized air from a suitable source (not shown). The air valves 148 and 150 are connected to the upper and lower interiors of the upper and lower cylinders 74 and 106 by suitable flexible conduits in a conventional manner.

In the operation of the aforescribed apparatus, the casing C to be retreaded and its adhered unvulcanized band 153 is first positioned upon the lower bead wheel 120. At this time the upper bead wheel 130 will be disposed upon the rod 124, as indicated by the phantom outline in FIGURE 4. Additionally, it is preferable that the rod 124 be in a lowered position so as to facilitate positioning the casing C upon the lower bead wheel 120. After the casing C has been positioned upon the lower bead wheel, the upper bead wheel may be slipped downwardly over the upper end of the rod 124 by aligning the stop pin 128 with the slot 132. Thereafter, the upper bead wheel 130 is rotated 90 degrees to its position shown in FIGURE 3. At this time the beads 154 and 156 of the casing C will be disposed within the annular groove 144 of the upper and lower bead wheels. A conventional curing bag 158 having a valve stem 160 is disposed within the casing C prior to the time that the top bead wheel 130 is attached to the rod 124. A conventional curing ring 162 encircles the radially inwardly facing portion of the casing C.

Next, the top bead wheel 130 is caused to move downwardly by admitting pressurized air to the upper interior of the lower cylinder 106. During downward movement of the upper bead wheel 130, the lower bead wheel 120 will be maintained in its elevated position of FIGURE 3. Accordingly, the beads 154 and 156 will be squeezed together whereby the outer diameter of the casing C is reduced. The upper and lower bead wheels are

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ed downwardly while remaining in their closely relationship whereby the casing C will be positioned within the matrix halves, the outer periphery of the casing clearing the ribs 164 of the matrix halves. After casing C has been disposed within the matrix cavity the flow of pressurized air to the upper and lower cylinders may be discontinued. The upper bead wheel is then rotated 90 degrees so as to release it from the end of the rod 124. Pressurized air is then admitted to the upper interior of the upper cylinder 74 so as to pull the lower bead wheel 120 downwardly away from the casing.

The matrix halves 166 and 168 are rigidly supported in the lower and upper mold halves 20 and 22, respectively, as by means of a plurality of bolts 170. During a curing operation these matrix halves will be heated by suitable means to a temperature approximating 300 degrees F. This heat may be provided by means of tubes 171 extending through the matrix halves. Alternatively, electric resistant heating elements may be used in conjunction with the matrix halves to effect heating.

Referring to FIGURE 7, at such time as the casing C is positioned within the lower matrix half 166 the upper mold half 22 will be lowered so as to place the matrix half 168 in abutment with the lower matrix half 166. This may be accomplished by means of the aforedescribed cylinder and piston units 40 and 42. It is next necessary to lock the upper and lower mold halves together by means of the aforedescribed lock bolts 60. This is preferably accomplished while the casing C is still maintained in its reduced diameter position of FIGURE 7. In this position with the casing in its reduced diameter position the upper matrix half 168 will readily abut the lower matrix half 166. It is therefore unnecessary to supply special means for effecting such abutment as the mold halves are being locked together.

Referring now to FIGURE 8, after the lock bolts 60 have been manipulated so as to rigidly secure the mold halves together the upper and lower bead wheels 120 and 130 will undergo vertical separation. Accordingly, the casing will return to its normal relaxed diameter. Thereafter, the matrix halves 166 and 168 will be heated to curing temperature.

At the conclusion of the curing operation it is necessary to loosen the treads 174 formed in the retreaded casing from the matrix ribs 164. To accomplish this the lower bead wheel 130 is first rotated 90 degrees to its position of FIGURE 3. Thereafter, as indicated in FIGURE 9, the lower bead wheel 120 is moved upwardly to effect concurrent upward movement of the lower casing bead 154. During such upward movement of the lower bead wheel 120, the upper bead wheel 130 is moved against upward movement. The upward movement of the lower bead wheel is effected by admitting pressurized air to the lower interior of the upper cylinder 74. The upper bead wheel may be locked against upward vertical movement by admitting pressurized air to the upper interior of the lower cylinder 106. The lower interior of the lower cylinder 106 contains air at a pressure lower than atmospheric at this time, and hence the lower cylinder 106 may move upwardly while the lower piston 40 and rod 124 remain stationary. The upward movement of the lower bead wheel will continue until the force from the pressurized air is exceeded by the force of the lower casing bead 154 against further upward movement, as indicated clearly in FIGURE 9. The upward movement of the casing beads 154 and 156 will pull the treads 174 formed in the lower half of the casing free of the matrix ribs 164 of the lower matrix half 166.

Next it is necessary to break the treads 174 on the casing C free of the matrix ribs 164. This may be accomplished by initially lowering the upper bead wheel 130 towards the lower bead wheel

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120 while the lower bead wheel remains fixed against downward movement. This may be accomplished by admitting pressurized air to the lower interior of the upper cylinder 74 and increasing the amount of pressurized air being admitted to the upper interior of the lower cylinder 106. This serves to squeeze the casing beads 154 and 156 together. With the casing beads held in this squeezed-together relationship, both wheels may be moved upwardly. Thus, as indicated in FIGURE 10, the upper portion of the casing C will be broken free of the matrix with the treads 174 being pulled away from the matrix ribs 164.

Referring now to FIGURE 10, after the casing C has been broken free of the matrix ribs 164, the upper and lower bead wheels will continue to exert a squeezing pressure on the casing beads 154 and 156. Accordingly, the casing will remain in its reduced-diameter condition. The upper mold half 22 may then be raised by means of the cylinder and piston units 40 and 42. Thereafter, the completed casing may be ejected upwardly from its solid outline position of FIGURE 11 to its phantom outline position therein by means of the upper and lower bead wheels. In this regard these bead wheels will continue to exert a squeezing pressure on the casing beads 134 and 156 whereby the outer diameter of the casing will be maintained less than that of the matrix ribs 164. The completed casing may be readily removed from the apparatus by initially removing the upper bead wheel 130 from the rod 124.

It will be apparent that the aforedescribed movements of the upper and lower bead wheels may be readily accomplished by proper manipulation of the air valves 148 and 150 whereby these valves will admit or discharge pressurized air from the upper and lower cylinders 75 and 106. It should also be particularly noted that the apparatus of the present invention will consistently provide retreaded casings having uniform treads. This is made possible because the casing will always be positioned in horizontal alignment with the matrix as the casing is disposed within the matrix cavity. Additionally, such results are made possible because the treads in the retreaded casing are completely broken-away from the matrix ribs prior to the time that the casing is ejected from the matrix. The aforedescribed apparatus moreover permits the retreading operation to be carried out with a minimum amount of labor and the least expenditure of time.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the present invention or the scope of the following claims.

I claim:

1. Tire casing retreading apparatus, comprising:
 - a frame;
 - a full capping type mold on said frame, said mold being formed with a cavity that receives a tire to be retreaded over its outer periphery and outer side walls;
 - a lower bead wheel coaxial with said cavity and engageable with the lower side of said tire casing;
 - first support means secured to said lower bead wheel;
 - first power-operated means on said frame secured to said first support means and operable to urge said lower bead wheel vertically in both directions relative to said mold cavity under power;
 - an upper bead wheel coaxial with said cavity and engageable with the upper side of said tire casing with said bead wheels when disposed in close vertical proximity effecting the reduction in diameter of said tire casing to less than the diameter of said mold cavity;
 - second support means;
 - readily detachable connection means between said upper bead wheel and said second support means;
 - and second power-operated means carried by said

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frame secured to said second support means and operable to urge said upper bead wheel vertically in both directions relative to said mold cavity under power either concurrently with or independently of said lower bead wheel.

2. Apparatus as set forth in claim 1 wherein said power-operated means are of the fluid-actuated type.

3. Tire casing retreading apparatus, comprising: a frame; a full capping type mold on said frame, said mold being formed with a cavity that receives a tire to be retreaded over its outer periphery and outer side walls; a lower bead wheel coaxial with said cavity and engageable with the lower side of said tire casing; a vertical shaft secured to said lower bead wheel; first power-operated means on said frame secured to said vertical shaft and operable to urge said lower bead wheel vertically in both directions relative to said mold cavity under power; an upper bead wheel coaxial with said cavity and engageable with the upper side of said tire casing, with said bead wheels when disposed in close vertical proximity effecting the reduction in diameter of said tire casing to less than the diameter of said mold cavity; a vertical rod; readily detachable connection means between said upper bead wheel and said rod; and second power-operated means carried by said frame secured to said rod and operable to urge said upper bead wheel vertically in both directions relative to said mold cavity under power either concurrently with or independently of said lower bead wheel.

4. Apparatus as set forth in claim 3 wherein said shaft is hollow and said rod is slidably telescopically disposed within said shaft.

5. Apparatus as set forth in claim 3 wherein said power-operated means are of the fluid-actuated type.

6. Tire casing retreading apparatus, comprising: a frame; a mold on said frame, said mold being formed with a cavity that receives a tire to be retreaded over its outer periphery and outer side walls; a lower bead wheel coaxial with said cavity and engageable with the lower side of said tire casing; a hollow vertical shaft secured to said lower bead wheel; fluid-actuated cylinder and piston means on said frame secured to said shaft and operable to urge said lower bead wheel vertically in both directions relative to said mold cavity under power; an upper bead wheel coaxial with said cavity and engageable with the upper side of said tire casing, with said bead wheels when disposed in close vertical proximity effecting the reduction in diameter of said tire casing to less than the diameter of said mold cavity; a vertical rod telescopically vertically slidably disposed within said shaft; readily detachable connection means between said upper bead wheel and said rod; and second fluid-actuated cylinder and piston means carried by said frame secured to said rod and operable to urge said upper bead wheel vertically in both directions relative to said mold cavity under power either concurrently with or independently of said lower bead wheel.

7. Tire casing retreading apparatus, comprising: a frame; a lower mold half fixed relative to said frame and formed with a lower cavity half that receives a tire casing to be retreaded over its outer periphery and outer side walls; an upper mold half movably attached to said lower mold half whereby it may be raised thereabove to receive said casing, said upper mold half being formed with an upper cavity half coaxial with said lower cavity half during a molding operation; power-driven means operatively interposed between said frame and said upper mold half to raise the latter relative to said lower mold half; releasable lock means securing said lower and upper mold halves together; a lower bead wheel coaxial with said cavity halves and engageable with the lower side of said casing; first support means secured to said lower bead wheel; first power-operated means on said frame secured to said first support means and operable to urge said lower bead wheel vertically in both directions relative to said

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power cavity under power; an upper bead wheel with said lower cavity and engageable with the upper side of said casing, with said upper and lower bead wheels when disposed in close vertical proximity effecting the reduction in diameter of said tire casing to less than the diameter of said cavity halves; second support means connected to said upper bead wheel; and second power-operated means carried by said frame secured to said second support means and operable to urge said upper bead wheel vertically in both directions relative to said lower cavity under power either concurrently with or independently of said lower bead wheel.

8. Apparatus as set forth in claim 7 wherein said first support means includes a vertical hollow shaft and said second support means includes a vertical rod telescopically slidably disposed within said shaft.

9. Apparatus as set forth in claim 7 wherein said power-operated means are of the fluid-actuated type.

10. In tire casing retreading apparatus that includes a fixed frame, and a full capping type mold on said frame formed with a cavity that receives a tire casing to be retreaded over its outer periphery and outer side walls, the combination of: a lower bead wheel coaxial with said cavity and engageable with the lower side of said tire casing; a vertical shaft secured to said lower bead wheel; first power-operated means on said frame operable to urge said shaft vertically in both directions under power whereby said lower bead wheel is movable from said cavity to a point exterior of said cavity; an upper bead wheel coaxial with said cavity and engageable with the upper side of said casing, with said upper and lower bead wheels when disposed in close vertical proximity effecting the reduction in diameter of said tire casing to less than the diameter of said cavity; a vertical rod movably secured to said upper bead wheel; and second power-operated means operatively supported by said frame connected to said rod and operable to urge said upper bead wheel vertically in both directions relative to said cavity under power either concurrently with or independently of said lower bead wheel.

11. Apparatus as set forth in claim 10 wherein said power-operated means include coaxial fluid-actuated cylinder and piston means.

12. Apparatus as set forth in claim 11 wherein said shaft is hollow and said rod is slidably telescopically disposed within said shaft.

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